

The
**DENTAL
DIGEST**

April

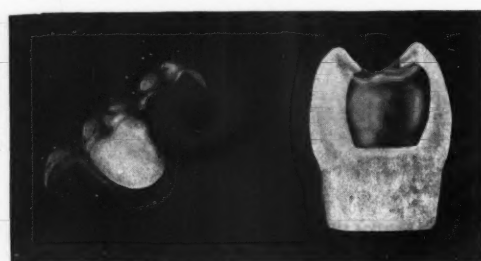
Vol. 40

1934

No. 4

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Two Surface	16 grains	44c	40c
M.O.D.	1 dwt.	66c	59c
¾ Crown	18 grains	50c	45c
Bridges, average per tooth	1¼ dwt.	82c	74c

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The DENTAL DIGEST



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FIXED BRIDGE TECHNIQUE

HARRY N. WORKHOVEN, D.D.S.

Sioux City, Iowa

OFTEN when the dentist is called on to construct a bridge in the posterior of the mouth, he decides to use what is known as a fixed bridge. The pontic in this type of bridge is usually entirely of gold and has no contact with the gum tissue. Because of the space between the gingival portion of the pontic and the gum tissue, any food particles are easily removed and the bridge is known as one of the "sanitary" type.

The following is an outline of the usual procedure in bridgework:

1. The construction of gold inlays in the teeth adjacent to the space left by the extracted teeth.
2. A bite is taken.
3. An impression is taken involving the teeth with the restorations and the space to be bridged.
4. An impression of the opposing teeth is obtained.
5. Upper and lower casts are made and they are set up on an articulator.
6. The pontic is waxed and cast.
7. The pontic is soldered to the inlays, and the bridge is polished and placed in the mouth.

By use of the technique to be described elimination of the following steps of the procedure outlined is possible: (1) the taking of the impression of the opposing arch; (2) making the opposing cast; (3) making the cast of the arch to be bridged, and (4) the taking of a separate bite.

Other advantages of the technique to be described are: (1) the substitution of a simple occlusal impression for the usual full impression of the arch to be bridged; (2) a simple means of keeping the pontic firmly in place while waxing and investing for soldering; (3) a much more satisfactory position of the pieces to be soldered, allowing an effective approach with the soldering flame, and (4) the possibility, if necessary, of making the bridge in two sittings.

Disadvantages of the technique to be described are: (1) the difficulty encountered when the abutment teeth are shorter than 5 mm.; (2) a possibility of distortion if care is not taken at certain important stages, and (3) a greater difficulty if more than the space of one tooth is being restored.

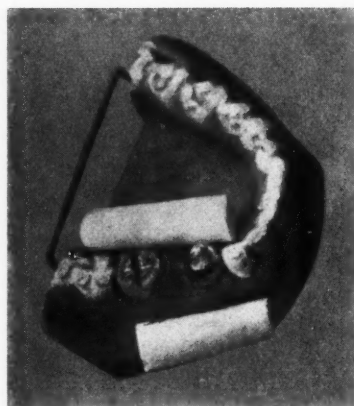


Fig. 1—The abutment inlays in position on the abutment teeth, a three-quarter crown on the first bicuspid, and a mesio-occlusal inlay on the first molar. The cotton rolls are in place so that the proximal surfaces of the abutment teeth next the space to be bridged can be thoroughly dried. Small wax attachments are seen added to the proximal surfaces adjacent to the space to be bridged. They will aid later in keeping the large bulk of wax firmly in position. Note the sharp occlusal grooves in the inlay. They aid in placing it correctly in position in the crown and bridge impression.

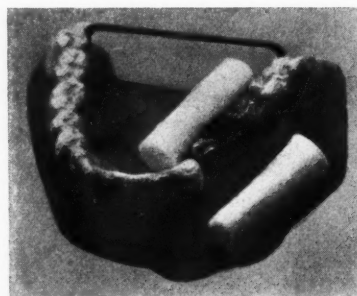


Fig. 2—The bulk of wax inserted in the edentulous space extending from the gum tissue above the occlusal plane. Note the sharp occlusal grooves in the inlay.

PROCEDURE

The procedure up to the time of taking the impression is not altered except in the formation of the abutment inlays. They are made with unusually deep and definite sulci to facilitate their correct placement in the impression later.

1. With the abutment inlays in position, cotton rolls are placed so that the proximal tooth surfaces to the

mesial and distal of the space to be bridged can be thoroughly dried—first with alcohol, and then with a pledget of cotton (Fig. 1).

2. A piece of black carding wax which has previously been inserted in the space to be bridged for measurement and carved somewhat to form is now heated until it is a little softer than at room temperature.

3. The portions of the wax that meet the proximal surfaces of the abutment teeth are heated with a spatula until they are flowing, and the body of wax is placed into the edentulous space with the flowing wax adhering at the mesial and distal to the proximal surfaces of the abutment teeth so that the main body of wax will remain well in place between these teeth (Fig. 2).

There is often difficulty in making the wax stick to the abutment teeth if they are short, or if they and the inlays are not thoroughly dry and clean. With short abutment teeth or those that slant, it may be found advisable to melt a little of the carding wax and place it directly on the proximal of the abutment teeth and inlays with a spatula (Fig. 1). The softened bulk of wax will then be more likely to stay in place because of its contact with the small wax attachments already on the abutment teeth.

4. When the body of wax is certainly sticking to and being held in place by the abutment teeth, the cotton rolls are removed without disturbing the wax, the occlusal surfaces of the abutment teeth are cleared of any wax, and the patient is made to bite down in his normal occlusion to register an occlusal impression in the carding wax of the teeth opposing the edentulous space (Fig. 3).

5. The mouth is opened and, when one has made sure the wax with the occlusal impression of the teeth opposing the edentulous space in it (Fig. 4) is firmly in place between the abutment teeth, and that the occlusal surfaces of the abutment inlays are not covered by wax, a mix of crown and bridge investment, with hastener, is made and placed over the occlusal surfaces of the abutment teeth and the wax between them (Fig. 5).

6. After it has set the investment

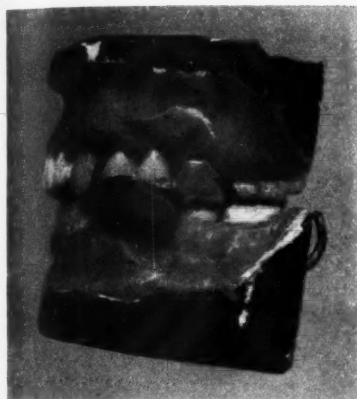


Fig. 3—The closure of the upper teeth into the bulk of carding wax and thus registering the impression of the occlusal third of the teeth opposing the edentulous space in the wax.

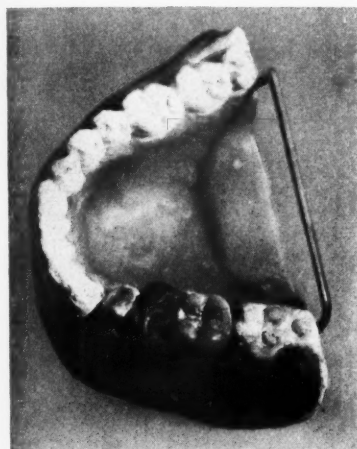


Fig. 4—Occlusal view of the lower arch after the occlusals of the opposing uppers were registered in the wax and the mouth opened.



Fig. 5—Taking an occlusal crown and bridge impression of the abutment teeth and the wax between them. The flowing of the investment into the impression of the opposing teeth in the wax creates a small cast of the occlusal third of these teeth at the same time as the occlusal impression of the abutment teeth and their inlays is taken.

impression is removed (Fig. 6). The crown and bridge impression that has just been removed will now contain the occlusal impression of the abutment teeth and inlays, and between the impressions of the abutment teeth and inlays will be the body of carding wax that has been between the abutment teeth. This wax is usually carried from the mouth along with the crown and bridge impression.

7. The carding wax is now removed from the crown and bridge impression, and beneath it, in the crown and bridge investment material, will be found an occlusal likeness of the teeth opposing the edentulous space (Fig. 7).

8. The inlays are now placed in their positions in the crown and bridge impression, their occlusal surfaces being against the investment material. The likenesses of the teeth opposing the edentulous area lie between the inlays (Fig. 7).

9. The likenesses of the opposing teeth between the inlays are covered with tin foil to preclude the necessity of relieving the finished bridge in the pontic portion (Fig. 8).

10. The tin foil is oiled, and inlay wax is melted or pressed into the portion between the inlays (Fig. 9).

11. This pressing or melting of wax against the occlusal likenesses of the teeth opposing the edentulous space furnishes the occlusal shape for the pontic, and the pontic is now carved to meet correctly the proximal surfaces of the abutment inlays next to it (Fig. 10). The occlusal-gingival thickness of the pontic is gauged by the positions of the gingival margins of the inlays, and the pontic is carved accordingly (Fig. 10).

12. The pontic is now removed from the impression where it was carved, and cast.

13. After it has been cast and smoothed off, the pontic is fitted into the space between the abutment inlays in the impression; its occlusal is separated only by the tin foil from being in contact with the occlusal likenesses of the teeth opposing the edentulous space, and investment is placed in the necessary places for soldering.

14. The bridge is then soldered, and the procedure is the same as usual from this point on.

CONCLUSION

If the occasion should demand the construction of the bridge in minimum time, the dentist can, by using the quick inlay technique I have previously reported¹ make the abutments in one sitting. In the same sitting, he can take the combination impression and bite as outlined here, and have

¹Workhoven, H. N.: Quick Inlay Technique, DENTAL DIGEST 38:418 (December) 1932.



Fig. 6—The crown and bridge impression after removal from the mouth and turning the impression with the part showing the impression upward. The carding wax is carried along with the investment on removal from the mouth. The positive likeness of the teeth opposing the edentulous space lies beneath the carding wax. The occlusal impressions of the abutment teeth are on each side of the carding wax.

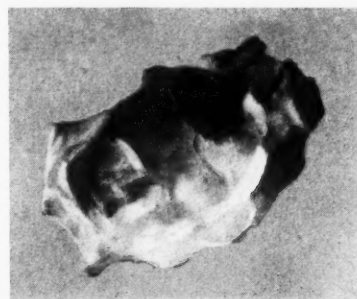


Fig. 7—The crown and bridge impression with the carding wax removed. The positive likeness of the occlusal thirds of the opposing teeth are seen between the inlays. The inlays are in place in the impression with their occlusal surfaces against the investment.

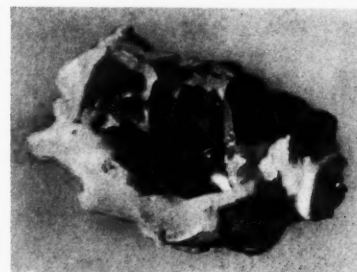


Fig. 8—The crown and bridge impression with tin foil covering the occlusal likenesses of the opposing teeth. This will aid in preventing spot grinding in the finished bridge. The tin foil or some other such substance may be used at the time the opposing teeth close in the carding wax to secure the same result.

the bridge ready for setting at the next appointment of the patient.

The greatest difficulty in using this method is in keeping the carding wax in position between the abutment teeth after the opposing teeth have registered their impression in it. Abutment teeth, however, that have been carefully cleaned and dried and are of ordinary length should not cause the operator undue difficulty.

If the operator desires a perfect stability of the carding wax, it may best be held securely by the placement

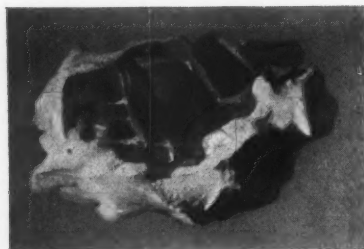


Fig. 9—Inlay wax being pressed between the abutment inlays to make a pontic. Its occlusal surface is formed by pressure against the likenesses of the opposing teeth. The tin foil lies between the wax and occlusal likenesses of the opposing teeth.

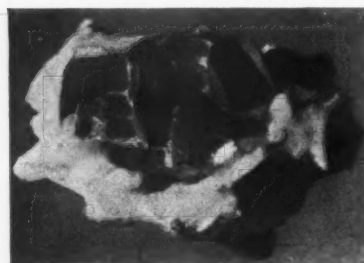


Fig. 10—The inlay wax in position between the abutment teeth after it has been carved to the correct shape for the pontic. The wax pontic is now removed and cast. The gold pontic is placed between the abutment teeth and will occupy the same position as the wax pontic in this illustration. Protecting investment is added, and the pontic is soldered to the abutment inlays.

35 Morningside Savings Bank Bldg.

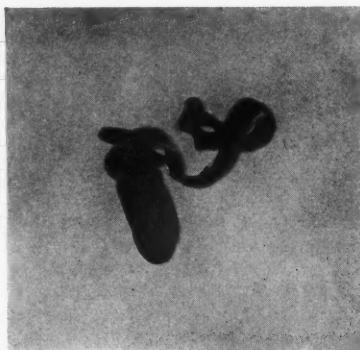


Fig. 11—The Ivory clamp which may be used to keep the carding wax in place when the opposing teeth are closing into it. Note the bend in the bow. It is supported in the illustration by a bit of compound.

of rubber dam clamps, Ivory numbers 17 and 18, on the abutment teeth. The bows of the clamps project into the edentulous space (Fig. 11, and 12). The clamp is placed upside down on the tooth making it possible for the alveolar ridge to fit into the dip in the bow (Fig. 12), and so allow the opposing teeth to close without encountering interference from the clamp. The use of the rubber dam clamps in this technique is so great an aid that plasticine may be substituted for the card-



Fig. 12—The Ivory clamp which may be used to keep the carding wax firmly in place between the abutment teeth. It is in position with the bend in the bow centered over the ridge to make it possible for the opposing jaw to close. The bow extending into the edentulous space makes an ideal attachment for the carding wax. The clamp is used upside down to gain the advantage of the bend in its bow; otherwise it would not allow the opposing jaw to close.

ing wax, and no concern with the drying of the abutment teeth is necessary. The clamp should be used to produce accurate results.

An attempt, by using this technique, to place a porcelain pontic that rests accurately on the gum tissue entails considerable difficulty, because there is no impression of the gum tissue. For the fixed bridge that requires no accurate fitting on the gum tissue, however, the technique described here will present a valuable saving of time and effort.

SICKNESS INSURANCE AND THE TRADE UNIONS

HERBERT E. PHILLIPS, D.D.S.

Chicago

THE interest of Senator Wagner and Miss Perkins of the Bureau of Labor in Washington in the creation of Compulsory Unemployment Reserves under the stimulus of the national government has been increasingly evident in the last few months. This interest is the result of trade union pressure and indicates a degree of shift in forces from industrial to labor groups. Those who have been following the discussions in the conventions of the American Federation of Labor will recall the strong indorsement of and demand for unemployment insurance by this body which is now so power-

ful. If unemployment insurance can be installed under federal stimulus there is every reason to suppose that *compulsory sickness insurance* can be developed under the same auspices. If labor unions are to continue to increase in power it will mean that professional groups had better get ready for either *voluntary* or *compulsory sickness insurance* by consulting with organized labor rather than with the industrialists.

Trade unions will probably demand a higher standard of health service for their members than will the industrialists. When trade unions finally do advocate sickness insurance

they will refuse to deal with commercial insurance carriers, for their policy on this question was established when they recommended that commercial insurance carriers be barred from participating in unemployment insurance.

One of the national leaders in the A. F. of L. recently expressed the opinion that when labor was ready to talk health insurance it would not be satisfied with the grade of health care given in the interest of the employees under the Workmen's Compensation Insurance—that the best health care was none too good for the working class.

5457 South Ashland Avenue.

MOULAGE

MARTIN SNYDERMAN, D.D.S.

Pittsburgh

A NEW material and a new process is now available for work in moulage. *Moulage* is the French word for *molding*, used to describe this work. With this medium reproductions can be made from the living or dead body, or from inanimate objects more quickly and easily than is possible with the materials which have been in use heretofore.

Up to now the casting of forms has been accomplished primarily with the use of plaster of Paris, paraffins, and various other compounds. All of these materials have their many disadvantages. Negocoll,¹ Hominit, and Celerit form our new working materials. Men in all fields of work can now use these to their advantage: the general practitioner in dentistry in taking casts of the face; the orthodontist in presenting his case before and after treatment; the physician, in plastic operations; the undertaker in making death masks; the police in all branches of detective work; the museums and their field men in reproduction of objects which cannot be moved; the artist in all body forms, and the lawyer in presenting negligence cases.

Negocoll is the trade name of the elastic negative modeling composition of a hydrocolloidal character. If a cast is to be made from the living, the subject sits or reclines in a comfortable position.

The model or object needs no special preparation. No separating mediums, such as vaseline or powder, are used to prevent the sticking and pulling of hairs. The eyes need not be covered and the nose needs no tubes. One is thus able to secure all details to which the Negocoll is applied. This is not possible with any other materials. The negative is sterile for each application, as it must be cooked

¹System of Doctor A. Poller of Vienna.

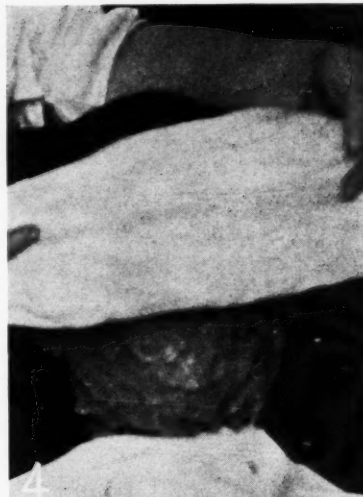
Fig. 1—Subject ready to be moulaged.

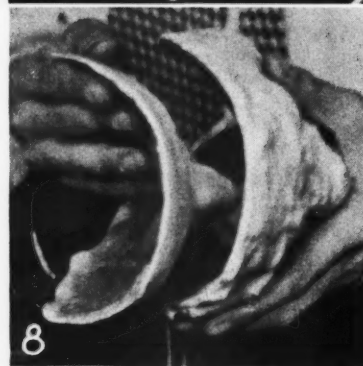
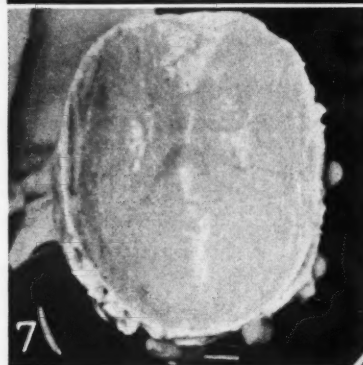
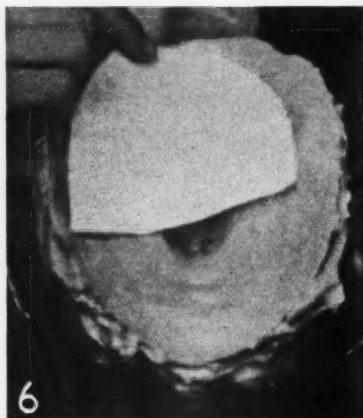
Fig. 2—Negocoll applied to proper thickness.

Fig. 3—Muslin added for reinforcement after the first layer has been applied.

Fig. 4—Cold cloths applied to hasten cooling.

Fig. 5—A, Negocoll removed, and B, Hominit being applied.





before use. It may be recooked as often as possible and applied again.

LABORATORY EQUIPMENT

The following is a list of the laboratory equipment now in use in my office and at the Falk Clinic of the University of Pittsburgh: laboratory tables with smooth, hard surface; electric hot plate (rheostat control); Bunsen burners; heavy enamelware (double boilers, $1\frac{3}{4}$ qt., $2\frac{7}{8}$ qt., $4\frac{1}{4}$ qt. for Negocoll; for Hominit, either single or double boilers, insets $1\frac{1}{8}$ qt. and $1\frac{3}{4}$ qt.; for Celerit, inset $1\frac{1}{8}$ qt.); cups and cup dippers; butcher tray; pans with covers; set of polished modeling tools; set of simple modeling tools; Negocoll, Hominit, Celerit brushes; correcting pins, pincers, scissors, brass wire; cheese cloth, wire mesh, burlap, muslin, plasticine; syringes (Negocoll); meat grinder; artist's complete color set.

TECHNIQUE

The required quantity of Negocoll is heated in a double boiler until it melts. The material may also be heated in a single enamel receptacle over a small flame where it must be stirred during the melting to prevent burning. It must be absolutely free from lumps before it is ready for use and can be thinned by the addition of water when cooking. Negocoll when completely melted must be cooled to a temperature that is not injurious to the object in question. It is then applied to form a consistent coating. The molding material must be well brushed into any irregularities as it is applied with a brush, spatula, or the hand. Muslin and wires may be added for reinforcement after the first layer has been applied. The entire object must be covered to a thickness that will prevent breakage when removing.

To hasten the cooling, cloths steeped in cold water or blasts of cold air may be used.

The Negocoll is removed after it is set which usually takes about ten minutes after the application.

Inasmuch as the material is elastic,

Fig. 6—A further strengthening material being added.

Fig. 7—Hominit added to cover all reinforcements.

Fig. 8—Positive being separated from negative.

Fig. 9—Nevus unius lateris.

Fig. 10—Bromiderma.

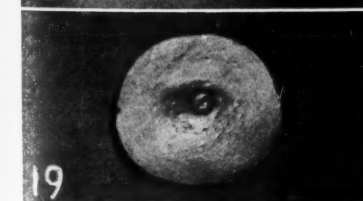
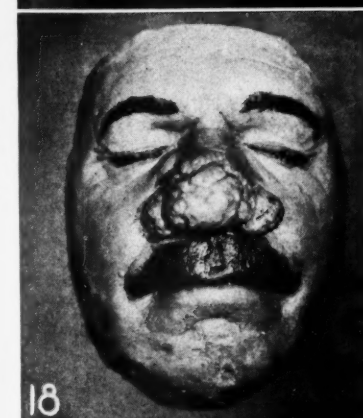
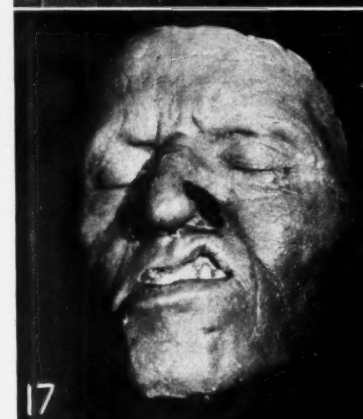
Fig. 11—Hereditary syphilis.

Fig. 12—Erythema multiforme.

Fig. 13—Moulage previous to plastic operation.

Fig. 14—Before orthodontic treatment.





one does not have to worry about the undercuts. It is also possible to make piece molds with Negocoll. Warm Negocoll will not adhere to the same material when cold. Should the Negocoll break, it may be mended with the use of pins which are attached crosswise from one end of the fissure to the other through the Negocoll. In order to prevent disappointing results when casts of inanimate objects are taken, those with porous surfaces, such as plaster of Paris, clay figures, and bones, must first be made water-tight, either by shellac or aluminizing. Plaster of Paris molds need only be saturated with water.

If the negative has any small holes or irregularities caused by air bubbles or improper application, these must be corrected by means of the Negative Improving Paste. This is applied to the Negocoll cast by a small spatula, finger, or a modeling tool. Any surplus paste can be scraped off with a soft wet brush. To prevent the formation of air bubbles, Negocoll must be applied briskly from the start. If the cooked material is not used immediately, it can be kept in a thermos jug where it retains its warmth for a long time and can subsequently be applied. The negative having been removed one is now ready for the positive known as Hominit.

HOMINIT

This material, the composition of which has wax for its base, comes in the following shades: carna, clair, creme, special carna, special clair, special creme. The three special shades are of a softer wax content.

In the preparation of the Hominit, I would suggest the use of double boilers, a set for each shade. While the melting process will take a little longer than in a single vessel, the necessity for watching the mixture will be eliminated. If too much of the Hominit has been heated, it may be left to harden and then reheated the next time it is required.

As soon as the Hominit is in liquid

Fig. 15—Moulage of a medical case.

Fig. 16—Carcinoma of antrum.

Fig. 17—Carcinoma of nose.

Fig. 18—Rhinopt yma.

Fig. 19—Nipple shown for detail.

Fig. 20—Nipple shown inverted for detail.

Fig. 21—Dancer's foot.

Fig. 22—Author's hand shown for detail.

Fig. 23—Carcinoma of lip.

Figs. 24 and 25—Orthodontia. Before treatment.

Fig. 26—Orthodontia. After treatment.

Fig. 27—Carcinoma.



form it can be applied. If despite all care the material begins to froth, the flame of a Bunsen burner should be held for a few seconds on it; the bubbles will then burst. The substance can be applied to the negative cast by a brush or by whisking. It is best to use brushes especially prepared to resist high temperature. Ordinary brushes are unsuitable, because their hairs break in the heat and consequently impair the pulp.

In applying the Hominit with the brush one should be sure that each stroke is applied over part of the previous one, so that no part is left uncovered. The application should be continued until the whole case is covered with a layer of the Hominit. A second coating of the positive is again applied. For further strengthening of the cast, muslins, burlaps, or wires may now be added; these are cut to the required shapes before they are placed in the cast. Hominit is added to cover all reinforcements.

CELERIT

When the layers of Hominit and
5050 Jenkins Arcade.

strengthening materials are of sufficient thickness, the last reinforcement is ready to be added. This is Celerit.

Celerit is prepared and applied in exactly the same manner as Hominit. Celerit differs only in that it contains more impurities, is darker in color, and is less expensive. When the finished positive has cooled, it is now ready to be separated from the negative.

Many positives can be made from the original negative if one is careful in separating the positive from the negative. For correcting mistakes on the surface of the positive, the Positive Correcting paste is used. This is applied with a modeling tool. Any mistakes can be corrected by the application of warm Hominit or Celerit.

COLORING

It is difficult to tell how to paint; that rests entirely with individual ability. The positive can be painted in the original colors from the outset by judicious mixing of the kinds of Hominit. It is imperative that a good grade of oil paint be used for the finer

shades.

The paints should be diluted so that details will not be destroyed. The colors must be applied with a brush. The cast is now ready for mounting.

CONCLUSION

A moulage is a reproduction finished in wax.

The advantages of the materials used for the moulage are: (1) There is no special preparation of the person or object to be moulaged. (2) The negative is elastic; therefore, undercuttings on the subject do not prevent the making of a one-piece mold. (3) It is possible to make piece molds if necessary. (3) The materials are clean and agreeable to handle; they are freshly cooked before each application and therefore are sterile. (4) The materials can be used over an open wound. (5) The negative can be used repeatedly and is therefore inexpensive.

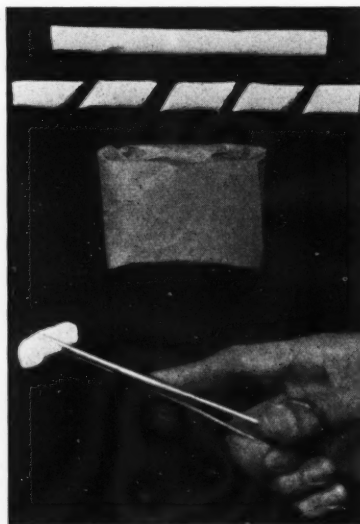
The accompanying illustrations show some of the striking replicas one is able to produce.

AN ORAL SURGERY SPONGE

GEORGE W. MATTHEWS, D.D.S., M.S., of Birmingham, Alabama, describes an economical and efficient sponge for use in all oral operations, which can be made quickly. (See accompanying illustration.)

These sponges are made by cutting a number 3, 6-inch cotton roll into five pieces. The cuts are made on the bias as shown in the illustration. This gives a larger absorbent surface and the point of the sponge can readily be introduced into a tooth socket. The sponge is grasped in the middle with a hemostat or Kelly clamp and both ends can be used.

Doctor Matthews has found the sponge described here to be far superior to the little pads of gauze which are supplied by the manufacturer for mouth surgery and much better and more aseptic than the usual practice of rolling up a ball of cotton between the thumb and forefinger and grasp-



ing it with the cotton pliers.

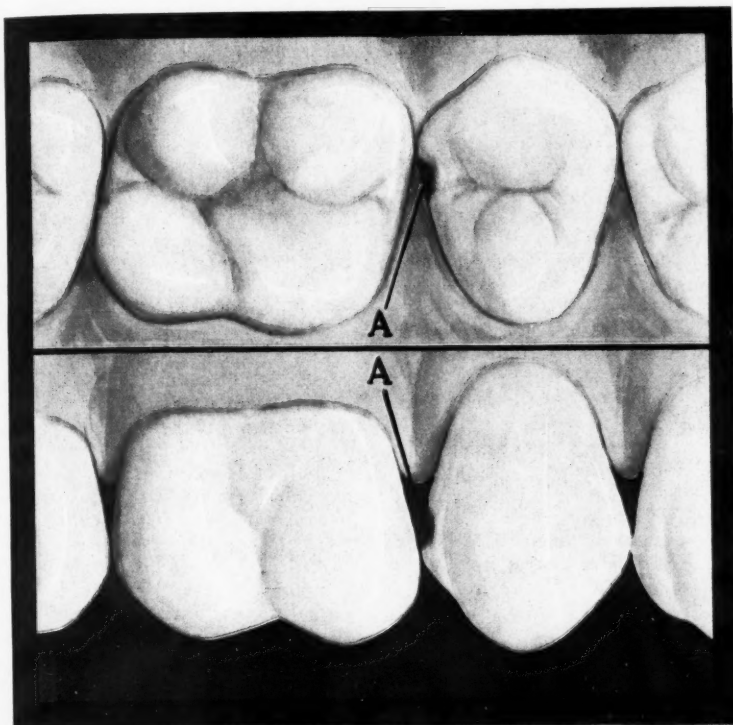
If an autoclave is available, a good plan is to wrap in small paper packages, as shown in the illustration, the required number of sponges for one operation. These can, of course, be autoclaved after wrapping and be opened perfectly sterile. It is unnecessary to touch the sponges with the hand when using a hemostat. If an autoclave is not available, the sponges can be cut up under conditions as clean as possible and kept in glass jars.

In addition to their usefulness in oral surgery, these little sponges are ideal for drying a crown preparation before cementation and for drying the mucous membrane before applying an antiseptic.

Doctor Matthews writes that this idea was suggested to him several years ago by Doctor Frederick F. Molt of Chicago.

THE EDUCATION OF THE DENTAL PATIENT*

VIII. THE REQUIREMENTS OF A CORRECT RESTORATION



To the Patient:

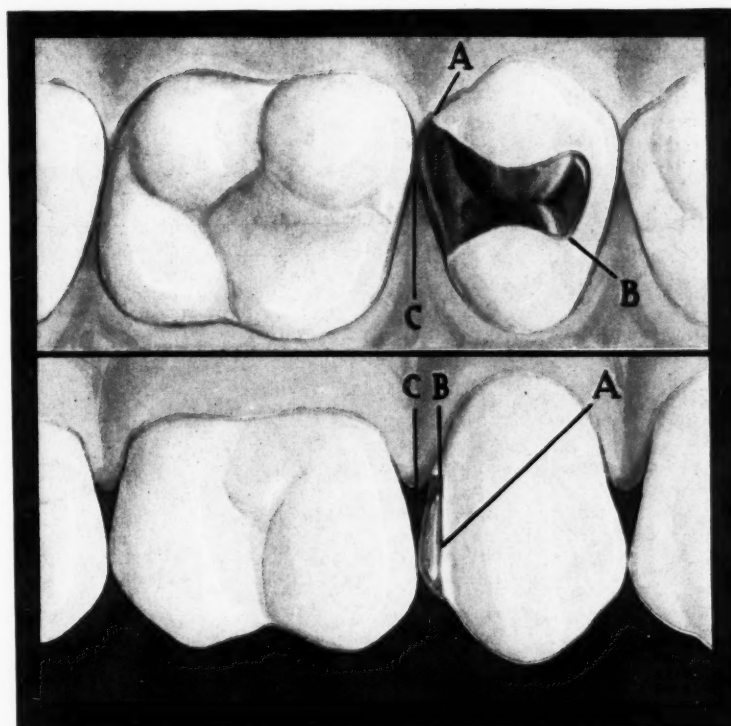
When your dentist removes a considerable part of your tooth in preparing a cavity remember that he does this for your future protection. The careful dentist knows that he must remove all traces of decay and extend the cavity margins to prevent recurrence of decay.

(A) Top and side view of a cavity.

(A) The margins of the restoration must be extended to self-cleansing areas: margins reached by toothbrush.

(B) The outline of the restoration must be such as to create a "lock" to hold the restoration in place.

(C) A contact point must be made to protect gum tissue from food impactions.



(A) The margin placed to be self-cleansed by toothbrush.

(B) The restoration and tooth must meet in a perfect joint.

(C) The contact point must be neither too high nor too low.

* This is the eighth of a series of charts intended for the use of the dentist in explaining important normal and pathologic dental conditions to his patients.

WHY DENTAL CARIES WITH MODERN CIVILIZATIONS?

IX. FIELD STUDIES AMONG PRIMITIVE INDIANS IN NORTHERN CANADA

WESTON A. PRICE, D.D.S., M.S., F.A.C.D.

Cleveland

WHEN one undertakes to find a colony of people living in any part of North America beyond the reach of modern commerce with all its efficient and varied means of transportation one may expect that only physical conditions can have made possible so distinct an isolation as to have sheltered these people from enforced modernization.

In my effort to locate groups of Indians living inside the Rocky Mountain watershed in the cradle of the Arctic waters I had the assistance of the officials of the Canadian government and the Hudson Bay Company and I am indebted to them for valuable aid. Throughout most of Canada the Indians have made treaty with the Canadian government or with its provinces and these Indians are receiving annual bounty. This has required them to come to certain places specified by the government on a certain date each year to receive this treaty money. Since this is a per capita income for the Indian he brings all his family, and this makes possible a registration and a regular official contact for matters of census and a record of health conditions. The Indians of British Columbia and the Yukon territory however, are not in the treaty and accordingly are not regularly in contact with government officials. In the northern part of British Columbia and the Yukon territory communication with the outside world is extremely difficult and the Indians live as nomadic tribes; they follow the game and have an independent, isolated existence.

The backbone or watershed of the North American continent is provided by the Rocky Mountain range. It is flanked all the way up the Pacific coast by the Coast and Cascade ranges of mountains. Even in southern British Columbia these ranges carry snow throughout the year. The snow line rapidly decreases in altitude as one goes northward with the result that glaciers weave their way through the rugged crags to feed the many streams with icy water. These glaciers are the birthplace of icebergs, the home of the chilly air that precipitates the moisture laden breezes from off the Pacific causing torrential rains in the summer and in the

winter blankets of snow 20 feet in depth for a single season. This ice laden country is the cradle of our northwestern storms. The running salmon like these icy waters. The Pacific slope dwellers, whether Eskimos, Indians, or the white newcomers could, if they would, and if the fisheries restrictions did not prevent it, harvest almost inexhaustible supplies of the varieties of fish that wend their way up these streams for the spawning season.

Our quest was for people who were beyond reach of these Pacific sea foods. When we look at a map of North America we note that there is a large district between the valley of the MacKenzie River as it flows to the Arctic and the Rocky Mountain

Divide which is sometimes spoken of as the "blind spot" of the North American continent as it can only be reached by overcoming great physical difficulties. It is practically impossible to enter by way of the MacKenzie River and its tributaries and get out the same season. This district cannot readily be entered by airplane because there are no bases for fuel. The most feasible approach proved to be from Alaska through the two coast ranges of mountains and then over the Rocky Mountain range to a waterway draining toward the Arctic. This was accomplished by going up the Stikine River to Telegraph Creek where the telegraph line crosses going to Dawson City and other mining districts on the upper Yukon River. This line was built at the time of the gold rush to that country. The trip up through the Coast and Cascade ranges of mountains is one of the most scenic trips on the North American continent.

Beyond Telegraph Creek a trail is the only route over the Rocky Mountains into the vast interior. This is the home of the moose and the grizzly bear. It is where the long cold winters make our finest furs. The Hudson Bay Company has established three posts inside the Divide in order to furnish an outlet for the furs of this district. This has made it necessary for this trail to be opened across the Divide from Telegraph Creek to the inland waterway. It cannot be called a road since roads have bottoms. At Telegraph Creek we en-

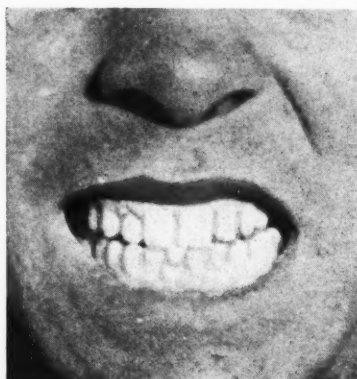


Fig. 1—This splendid Indian boy is the product of the natural foods of wild game. His physical and dental development are superb. He has no dental caries or gingival infection.

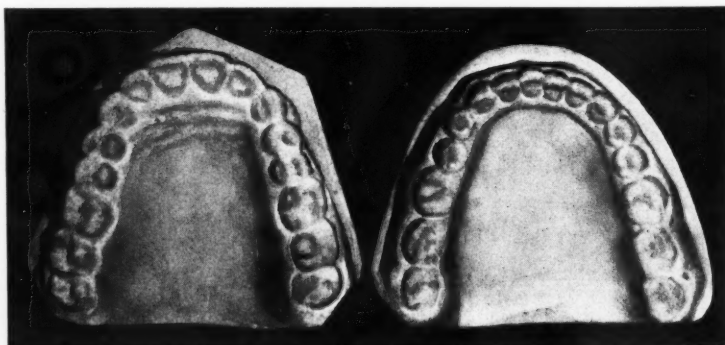


Fig. 2—Note the symmetry of the arches of the last figure. At 21 the third molars are nearly erupted and in excellent position.

gaged a truck to take us over the Divide. My esteem for the hardihood of a modern truck has been increased since I took this trip. Sometimes the trail led along the edge of the precipice cut in the side of the cliff in the shale where if the roadbed gave way we would be sent hurtling to the torrent in the gorge below. We had two drivers who took short turns and they kept us interested by pointing to places where parties had tumbled down the bank where the road collapsed. At times we would go a half mile on the road cut in the edge of the cliff without reaching a place where two conveyances could pass. Since there were only two conveyances available for running each driver knew where the other was supposed to be. We were beginning to understand why the districts to which we were going had been referred to as the "impenetrable north."

We found that there were only two white women inside the Divide, one the wife of the manager of the Hudson Bay Post at the landing at Diese Lake and the other the wife of a mining prospector.

At Diese Lake (number 26 on the map) we engaged two guides and a powered scow large enough to place a tent on the bow to protect our bedding from the frequent rains. Going down stream was easy though dangerous since the river had many treacherous and sudden rapids. We would sometimes sail for an entire day without seeing a sign of human life. We were pushing on to the farthest north Hudson Bay Post of this system to which the Indians had trekked with their furs for hundreds of miles from several directions. We were again in the zone of the long twilights where the light is sufficient for photographing until a late hour. We were now in a country where most of the Indians had never seen a white woman until they saw Mrs. Price. It is of interest that although we slept on boughs that were damp and in blankets that could not be dried sometimes for days, we did not once catch cold.

At the second to the last post, McDames, number 27 on my itinerary map, there were large numbers of Indians who had come to trade their furs for traps and ammunition and such other supplies as they could carry to their hunting grounds several hundred miles away. We were with people who were living almost entirely on game, most of which consisted of moose, caribou, bear, mountain goat, and mountain sheep. At Liard, number 28 on the itinerary map, the last Hudson Bay Post, we met Indian families that had come from several hundred miles to the north; others

from their hunting grounds to the east and west. Not one of them had ever spent a day in school of any kind except the school of the forest. We were among people where I found it necessary to examine a thousand sound teeth for each tooth that had been attacked by tooth decay. Practically every dental arch was symmetrical with no teeth malposed. The nostrils were uniformly broad and the air passages clear. I did not see one single child among these relatively primitive people with bow legs, or evidence of past or present rickets.

In the winter these people live largely in the cabins built of logs banked high with moss and dirt and located in heavy forests usually near a river or lake. Trees are girdled in advance in order to provide dry fuel. A quantity of moose meat is dried in the summer and stored for times of food scarcity or emergency. It is of interest that when the meat has hung for an hour in the bright sunshine the outside becomes sufficiently waterproof so as not to need to be brought in out of the rain and will not be attacked by flies.

In milder weather if the moose cannot be killed near at hand the family may move to set up camp beside a recently killed moose which may supply the wants of the household and dogs for several weeks; however, they do not select the meat that modern civilization does. It seems to be an inherent part of their conception of life that in order for a man, woman, or child to have a perfect body he must eat some of every part of the moose. This, of course does not include such structures as are indigestible, as hide, hair, hoof, and bones. They do, however, break all large bones to remove the marrow. Each cabin is supplied with a food cache, built about 1 foot high and reached by means of a ladder, and it is so constructed that wild animals cannot climb the four posts on which it stands to reach the stored furs and foods.

Through an interpreter I asked an elderly Indian what they would do for food when moose became scarce. He replied that they were usually plentiful. Then I asked him what he would do if he and his family were starving and after a long chase he succeeded in killing a moose. He said the first thing he would do would be to take a drink of the blood which would make him strong. He would then lie down beside the warm moose and go to sleep for a little while, after which he would get up and remove from the moose a large part of the liver and a large bone to take home to the hungry family. When I asked what the bone was for he said for the marrow to use for food for

the baby. When I asked why he would take the liver he said that the liver was full of life. The Indian explained how the moose eats buds of trees which were strong foods. The strength goes from the buds into the wall of the stomach and he explained that the Indians clean the stomach and pound the wall up fine to make a milk for the baby. They also know the various parts of a moose to use for correcting various disturbances. For example, they use the adrenal glands for curing scurvy which is caused by an insufficiency of vitamin C. Science has just recently discovered that this gland is the richest known source of vitamin C. Similarly they know that the tissues forming the back part of the eye is good for food. Science has recently demonstrated that the retina of the eye is one of the rich sources of vitamin A.

When I pressed the question as to what they would do for food if they could not find any moose the old Indian named other animals and said that the livers of all animals were good food. I asked what they would do if they could not find any animals and asked whether they would starve. The Indian replied that there are many foods, as the buds of trees and the inner bark of certain trees which they could eat. Later he brought samples of bark of the trees they could use.

The grizzly bear constitutes one of their greatest dangers. But they know his habits and plan to leave him alone. The bears are in the higher ranges in the summer and are denned in from October to early May. Sometimes, however, the grizzly follows the scent of meat down the mountain as it is dragged to a cabin. But his fear of fire generally protects the natives since they keep an open fire when in danger. We were served mountain goat, and were told that on a previous occasion when a mountain goat had been dragged to the cabin a grizzly bear had trailed the catch and was heard clawing at the door. He was shot through the cabin door, and we were shown the bullet hole. The bear's enormous hide was spread upon the cabin floor.

During their brief sojourn near the Hudson Bay Post the Indians would celebrate by exchanging furs for such modern foods as could be obtained, particularly tea, sugar, and white flour, and some canned foods. Of course, dairy cattle are out of the question since they cannot be kept where winters are so severe. Almost no vegetables or fruits are grown by the native Indians and few wild fruits are available. Samples of their various foods were obtained and brought back to my laboratory for

chemical analysis.

At McDames, the second to the last Post toward the north, seventy-one Indians were examined with a total of 2,004 teeth. Thirty-seven of these Indians had lived almost exclusively on native foods except when they came to the Post. Of the 1,028 teeth, all of which I examined, not a single tooth had ever been attacked by tooth decay. Twenty persons had obtained "store grub" more frequently and among their 810 teeth only one tooth was found to have ever been attacked by tooth decay, or 0.1 per cent, or 0.05 per cent for these two groups combined: one in 2,000. There were six in the family of the manager of the Hudson Bay Post. The mother was an Indian. She and her children had in their 166 teeth, forty with dental caries, or 24.7 per cent. They were living on food taken from the shelves of the Post—the foods of modern civilization which had been shipped into the interior. This increase is 494-fold.

At Liard, the farthest north Hudson Bay Post of this interior system, fifty-eight Indians were examined with 1,642 teeth. Thirty of these Indians had been living almost exclusively on native foods and of their 876 teeth not a single tooth was found that had ever been attacked by tooth decay. Nineteen were occasionally using "store grub" and of their 546 teeth, six were found to have been attacked by tooth decay, or 1 per cent. There were nine persons either connected with the Post or remaining near it who were living largely on "store grub"; of their 248 teeth, sixty-seven had been attacked by dental caries, or 27 per cent.

For all the people who were living on the game of the country the dental arches were symmetrical, and the third molars were in normal position in practically all persons more than 21 years of age. Not a single case of malposed or irregular teeth was found among the most primitive. The teeth were often considerably worn but no overload was sufficient to destroy the immunity to tooth decay. Apparently the bodies of mothers of large families were as strong as any others of the group; their dentitions were also as perfect. Their custom provided that the women and children accompany the men on their expeditions to the Post to dispose of their furs. When the journey is overland each carries a share of the camp outfit. The poles for the shelter for the camp are always easily secured at any camp site. The roof of the shelter is sometimes made of bark which is carried with them and which is peeled thin. When the journey lay along a waterway they pile into a large dug-out canoe

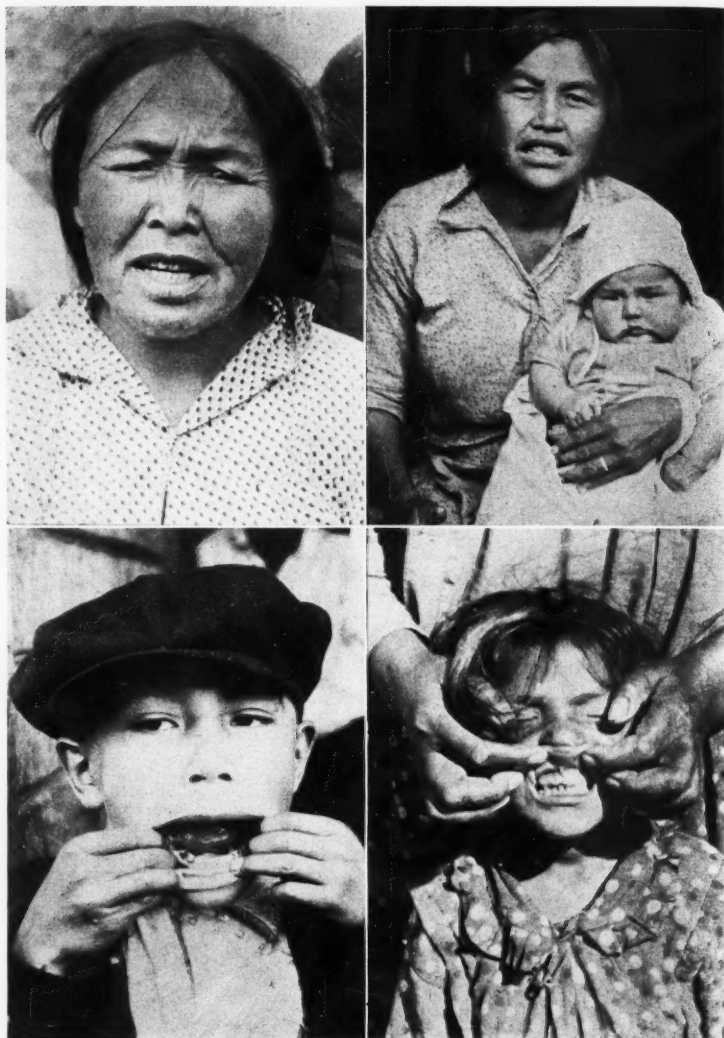


Fig. 3—Upper left—In some Indian families the incisors are concave from side to side on the labial surface instead of convex, as in this case. No caries or gingival infection is present.

Fig. 4—Upper right—Mothers and infants among these more primitive Indians have excellent health and even child-bearing does not destroy immunity to dental caries.

Fig. 5—Lower left—The growing boys and girls who are receiving the available modern foods usually suffer from rampant tooth decay as in this case.

Fig. 6—Lower right—Dental caries begins early; it often is rampant at 3 years of age, as in this case in which the crowns of the deciduous teeth are decayed to the gum line.

and paddle with skill through the rapids. These waters draining toward the Arctic do not have the running salmon of the Pacific coast rivers but do have pike and white fish. The Indians spear some of these through the ice in the winter. They are difficult to catch in the summer with their meager equipment, for white fish cannot be caught with a hook and line. They make a nutritious milk for the babies by grinding and squeezing the juice of the fish muscles. In a later installment I will discuss the results of the chemical analysis of the foods including the milk made from fish and the stomach wall of the

moose. They do not dry and store fish as do the Indians and Eskimos of the Pacific watershed since the fish are not available in sufficient quantity.

We are now chiefly concerned to observe these people of extraordinary physical perfection and high immunity to dental caries and degenerative diseases, living at the point of contact with modern foods. We are at the extreme fringe of modern civilization as expressed in the farthest north Hudson Bay Post of this part of the interior. If mail were to reach this Post for Christmas we were advised it would have to come a thousand miles by dog team. It is only

this extreme isolation that has protected these people against the inroads of modern commerce since provisions entering this country must come by way of the Stikine River to Telegraph Creek and then, in limited quantities, over the Rocky Mountain Divide.

At Dease Lake, the first Post inside the Divide, twenty-five Indians were studied in two groups; 9.6 per cent of all teeth examined had caries. Nine of these Indians were relatively primitive nomads and of their 240 teeth none was found attacked by dental caries. The others were using in part modern foods and in part native foods, and in this group 14.9 per cent of all teeth had dental caries.

At Tahltan, an Indian settlement near Telegraph Creek and with year round contact with it, thirty-seven Indians were studied with a total of 936 teeth, of which 163 or 16.3 per cent had been attacked by tooth decay. All but one had been using chiefly modern foods. When, therefore, we arrange the data in the order of contact with civilization, Wrangell, at the mouth of the Stikine River, studied in the last installment, with year round frequent service from the coast steamships, showed caries in 39 per cent of all teeth. At Telegraph Creek and Tahltan with summer boat service up the Stikine River to the former, at the end of navigation, showed caries in 14.9 per cent of all teeth. At Dease Lake over the Divide which is in contact with the Dease Lake Hudson Bay Post, 9.6 per cent had caries; while at McDames and Liard, the two Hudson Bay Posts farthest in the interior, only 3.1 per cent of all teeth examined had dental caries. On the basis of modern or primitive foods these figures for dental caries are for an average of seven Indian coast settlements using modern foods 40.8 per cent and for the Indians in the interior beyond reach of modern foods, 0 per cent.

At Telegraph Creek, therefore, we had an opportunity to study Indians that are of the same or similar tribes but who are in contact with the foods of modern civilization. Many of them live, however, in the typical shelters of that country. A number of Indian homes were found where the parents had grown up under the primitive conditions but who are raising their families partly on modern foods as shipped into that country. At Telegraph Creek the percentage of teeth with dental caries when compared with the primitive districts we have just been studying increased from 3.1 for all groups to 13.9 for all groups. For eleven persons still living on native foods only four of 320 teeth examined, or 1.2 per cent, had been attacked by tooth decay. Seventeen with

416 teeth living on both native foods and "store grub" had thirty-seven teeth, or 8.8 per cent, attacked by dental caries. Eighteen living on modern foods with 528 teeth had 135, or 25.7 per cent, already carious. Indian families, however, that bring their furs to Telegraph Creek for barter but who live at a distance and only have access to the modern foods during their few days or weeks at the Post once or twice a year, still maintain their high immunity, their being only 1.2 per cent of teeth with dental caries. While some provisions are carried over the Divide and become available for Indians living in the vicinity of the first Post on Dease Lake, the elderly people of these families had the typical perfection of physical development and tooth structure of the primitives farther north. Their families, however, often had active tooth decay.

As serious, however, as the problem of dental caries has become for these people it was exceeded by the development of other degenerative processes. I have referred to the fact that one of the leading Indian scholars of the western coast informed me that the primitive Indian languages did not have words for "rheumatism" or "arthritis" in any of their various forms. He said these diseases were unknown to the primitive Indians. At the point of contact with modern civilization where the only apparent important change has been the displacement of the native foods with the foods of modern commerce, I found arthritis and tuberculosis were common. In a group of twenty homes at Telegraph Creek and its vicinity I found ten bedridden cripples. Many of these cases were so hopelessly advanced that nothing could be done.

We assisted the Indian agent at Telegraph Creek by bringing out three Indians who were in desperate need of help; one was a youth of 19 so crippled with arthritis that he could not wait on himself or feed himself; another was a girl, aged 18, whose condition was almost as serious; the third was a man, aged 30, who had walked and ridden his horse a distance of two hundred miles seeking help for his crushed shoulder. We took charge of these three in the journey down the Stikine to Wrangell and transferred them after a couple of days' rest to the coast steamer and conducted them to a government hospital at Prince Rupert where they received medical and surgical assistance. The man's shoulder was crushed in May and it was about the tenth of August when he reached the hospital. Fortunately, all three were able to be returned to their homes before river navigation closed. The arthritic pa-

tients were well on the road to recovery. The man with the broken shoulder was doubtless one of the proudest and happiest Indians on the continent, for I was advised that he insisted on showing to every one whom he could interest what the "white doctors" had been able to do for him.

But what of those who did not have the good fortune of these three? It is a sad scene, the calamity that befalls these people when suddenly they lose their immunity to dental caries and to other degenerative processes and rapidly become victims of the modern degenerative diseases. We can imagine what the plight of our various communities would be if there was suddenly taken from them every physician, dentist, nurse, hospital, drug store, and first aid station leaving every one to suffer without the possibility of obtaining the relief as provided by modern science. Such is the plight of these people on the fringe of civilization. Occasionally, one would see a running fistula on the outside of the face of a boy or girl which had already made a lasting scar. An abscessed tooth had broken externally. Perhaps the picture that most persistently haunts one who has seen it is the widespread distress due to tuberculosis. Scarcely a home in some modernized districts would be found where some member of the family had not already been taken by the white plague or was at present sick with it. In many districts from 20 to 30 per cent of the children were already dead as the result of this disease. One of the important phases of these investigations is the new light that is being thrown on the factors that contribute directly to the lowering of immunity to this and other degenerative processes. This will be discussed in a special report at the conclusion of this series.

These investigations are revealing evidence of an important relationship between physical development of the face and dental arches and dental caries as different expressions of nutritional deficiencies. We will, accordingly, keep in mind facial contours and relationship between dental arches as well as symmetry of the arches. It is of evident significance that in modern clinical practice in a so-called civilized community one will not see for many weeks and months a single pair of dental arches of such fine symmetry as even the average among these primitive Indians of the interior. A fine example of this symmetry is that of the young man shown in Fig. 1. He is 21 years of age and entirely free from dental caries. His gums are healthy and the symmetry of the arches excellent. Impressions

were taken under difficult conditions; the models are shown in Fig. 2. The third molars are just erupting. There is no dentist within hundreds of miles. The young man is a little more than 6 feet tall, straight, and weighs about 180 pounds. It will be recognized that he was asked to close his teeth so as to make contact on the anterior teeth.

Many of these groups of Indians of the interior of northwestern Canada present teeth of an unusual anatomic design in that the upper centrals instead of being convex from side to side are slightly concave. This will be seen in Fig. 3. The teeth of this elderly woman show some wear but are free from dental caries.

It is of particular importance to note and emphasize that the factor of safety against dental caries of these more primitive Indians was so great that even child-bearing did not constitute a sufficient overload to endanger the teeth. The health of the children of all ages was exceptionally fine so long as they were on the natural diet of the district. A typical

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case is shown in Fig. 4, and it will be noted at once that this mother has exceptionally good teeth and symmetry of the dental arches. An example of the rampant tooth decay of growing boys and girls when on modern foods is shown in Fig. 5. At an early age the crowns of many of the teeth may have been lost by caries as shown in Fig. 6.

One can never forget the profound impressions produced by seeing two groups within sight of each other, one a band of nomads who have come in from the wilderness with their furs to trade for modern ammunition, clothing and traps but whose lives will be spent entirely in the seclusion of the big timber, companions of the wild life and sharing their physical perfection; the other, a band that is lingering perhaps the year round within reach of a Hudson Bay Post though still spending some time on the trap-line to secure furs for trading for white flour, sugar, and canned goods. They are infatuated by the touch of modern civilization. The first group has perfect dentition and

is excellent physically; the second group is scourged with modern degenerations, which I believe are preventable. Certainly, something should be done to help them, yet how can we help them until we have learned how to help ourselves? We go reverently and humbly to the first group and ask them for the secrets of their more sound bodies and their happy and carefree lives. However, we have not glimpsed as yet at the real contrast between these two groups and cannot until we study in more detail the tragic plight of the latter owing to our modern degenerative diseases. These we will review in the last communication of this series.

(End of Ninth Installment)

COMING

- X. Field Studies Among Modernized and Primitive Eskimos of Alaska.
- XI. New Light on Loss of Immunity to Some Degenerative Processes Including Dental Caries.

ROOT REMOVAL

EARL A. THOMPSON, D.D.S., of International Falls, Minnesota, suggests the following simple method of removing a broken root:

1. A roentgenogram is taken to determine whether the root is reasonably straight and whether hypercementosis is present.

2. An inverted cone bur (about number 37), the size of which will depend on the size of the root to be removed, is inserted in the socket from which a root has been extracted. Cancellous osseous tissue is quickly and easily penetrated.

3. The bur is sunk to a depth of from one-third to one-half the length of the remaining fractured root, and at the proper depth a notch is cut in the fractured root. The bur is then removed.

4. An ordinary metal crochet hook, size about 6, depending on the size of the bur used, is inserted; the hook is caught in the notch made with the bur in the root, and the root is removed.

This method eliminates the danger of forcing apexes of upper posterior roots into the maxillary sinus. Also, there is much less destruction of tissues by this method than by surgical removal of the root or by entering through the buccal plate.

A spear-shaped surgical bur may be used. The pointed bur makes penetration more rapid and definite, and the notch can be made at the same angle as the hook; however, the inverted cone bur as suggested can be used satisfactorily.

Fig. 1—Inverted cone bur sunk from one-third to one-half the length of the remaining root.

Fig. 2—Notch in root made with bur used in Fig. 1.

Fig. 3—Crochet hook inserted in notch. Root ready to be removed.

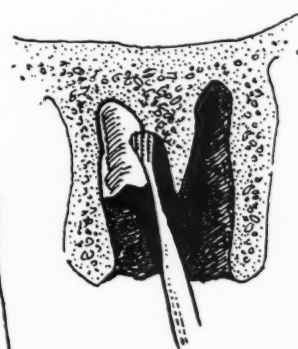


Fig 1

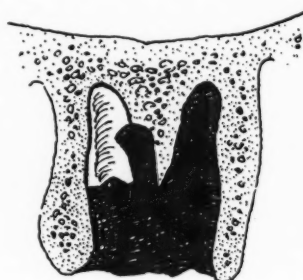


Fig. 2



Fig. 3

SYPHILIS OF THE ORAL MUCOSA*

LESTER HOLLANDER, M.D.

and

B. A. GOLDMANN, M.D.

Pittsburgh

(Continued)

DIFFERENTIAL DIAGNOSIS

The following are the important diseases to be taken into consideration in differentiation:

1. *Herpes Labialis, Herpes Simplex or Fever Blister*—Some points have already been mentioned in the differentiation of these two conditions. The following may be added: Herpes is usually a recurrent condition. In some persons, dietary indiscretions, slight febrile conditions, or nervous excitement may precipitate an attack. About twenty-four hours before its onset, the patient experiences a burning or stinging; this is followed by the appearance of an area of erythema or redness; in a few hours two or three crops of vesicles (blisters) appear on this erythematous or reddened base, confined to a limited area. At first the contents of the vesicles consist of a transparent, and watery serum, but as the roof of the vesicles is thin and breaks readily and it becomes infected, the serous fluid changes to a turbid one, and minute necrosis follows. The entire area then consists of an elongated red base covered by a few groups of vesiculopustules. Where the vesicles have been denuded, minute ulcers will be found. There is no induration present, and only rarely is there an accompanying regional adenopathy as the result of a secondary infection. But in this instance the lymph nodes remain small and are painful.

A chancre, when it occurs in this form, as pointed out, assumes an entirely different course; is not associated with discomfort; becomes indurated early; does not tend to heal with the rapidity of a fever blister, which usually, when it is uncomplicated, runs its course in about seven days; and the lymphadenitis is much more noticeable and much less painful.

2. *Impetigo Contagiosa*—The inoculation of the ordinary pus-producing cocci, staphylococci, or streptococci is followed by the appearance of a local inflammatory reaction. On account of extensive edema of the affected cells, and on account of the pouring out of the polymorphonuclear leukocytes, a necrotic crust-covered lesion is produced. The onset of this

eruption and its course is rapid and it rarely remains localized. Still its appearance might be confusing; this is especially true of the type occurring at the vermillion border of the lip which is associated with lymphatic involvement.

If the impetigo starts as a small vesicle, a slight lifting up of the epidermis, forming a collarette around the lesion, becomes pathognomonic. If it is of the encrusted variety, the

crust appears to be stuck on. Generally there is a multiplicity of lesions, which occur on the face or hands. Induration is lacking, except in the deep-seated form called ecthyma.

3. *Drug Eruptions*—The oral mucosa, especially that of the lip, is a frequent site of eruptions produced by drugs, such as antipyrin, phenolphthalein, phenobarbitol, iodides, and bromides. Usually this eruption begins as a flat blister on a somewhat cyanotic or bluish base. It is slow in progression unless the dose was huge or the idiosyncrasy high; it is usually multiple in character. In the bromides or iodides the lesion may be vegetative or warty in character, but those produced by other drugs are usually of the large blister or bullous variety. The eruption is painless, unassociated with regional adenopathy; bizarre multiple lesions are produced either in the mouth or on the skin surface, having characteristics varying from a flat, reddened, erythematous patch to a lumpy formation which might resemble a painless large carbuncle, or to a warty, hypertrophic tumor.

4. *Granuloma Pyogenicum*—This is a protruding, tumor-like lesion which is composed of granulation tis-



Fig. 21—Syphilis secondary. Note the erosive papules on the tongue, the lower lip and at the angle of the mouth.

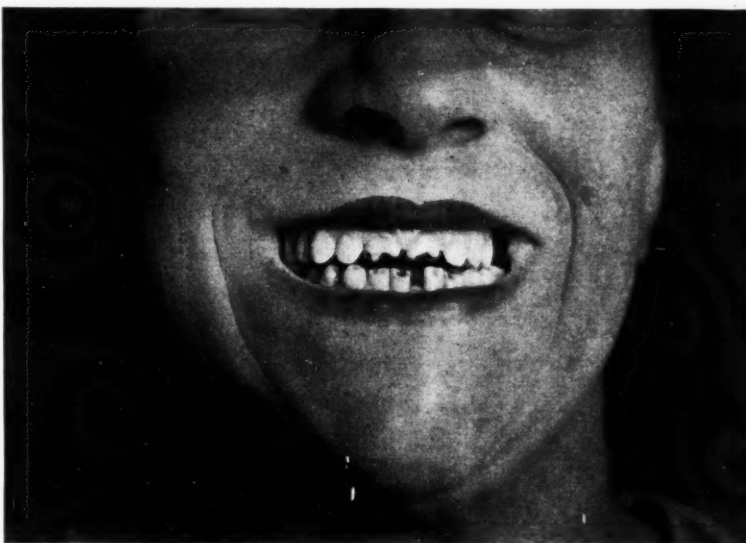


Fig. 22—Congenital syphilis (Hutchinson's teeth). Note the indentation of incisors and the unevenness of teeth. (Courtesy of Doctor Howard Fox of New York.)

* From the Pittsburgh Skin and Cancer Foundation.



Fig. 23—Congenital syphilis. Note the deep lines which run concentrically about the mouth. These are pathognomonic. These deep fissured lines bisect wrinkles in the normal folds of the skin.



Fig. 24—Congenital syphilis. Nodulo ulcerative tertiary syphilis. Note nodulation, ulceration, crescentic border, spreading peripherally. To be differentiated from a bromide rash. (Courtesy of Doctor Howard Fox of New York.)



Fig. 25—Congenital syphilis. Note destruction and scar formation produced. (Courtesy of Doctors W. H. Guy and F. M. Jacob of Pittsburgh.)



Fig. 26—Congenital syphilis. The end-result of a destructive ulcerative process which was not recognized in time to prevent it.



Fig. 27—Gumma of the upper lip. Resembles a chancre but it is not associated with regional adenopathy. The dark field examination was negative. The blood was strongly positive in the Wassermann test.

sue of dark red color, showing pinpoint, pus-containing vesicles, and hemorrhagic on account of the presence of a great many newly formed blood vessels. Actually it is ordinary "proud flesh" which has become infected. The protruding mass is surrounded by a cuff composed of the surrounding epidermis. The development of a granuloma pyogenicum is slow, painless, and is unassociated

with lymph node involvement.

5. *Carcinoma*—Especially in older patients the question of differentiation from carcinoma becomes a pertinent one. The induration of a chancre may be confused with the hardness of a carcinoma. Ulcerative changes in a carcinoma may be readily misinterpreted as the necrotic changes in a chancre and vice versa, so that at times clinical differentiation becomes

exceedingly difficult. In the early case, however, one can place reliance on the history of the evolution of the lesion. Carcinoma is much slower in its development; it may begin either as an indolent ulcer which breaks down peripherally and centrally in an almost imperceptibly slow manner, or it may begin as a tumefaction showing little or no tendency to break down at first. The pathognomonic

sign of carcinoma has been referred to as a "plaster of Paris" hardness, but it must be pointed out that a great deal of experience is needed to be able to differentiate this from the indurative changes of a hard chancre. Lymphatic gland involvement occurs in both diseases, but of course, in carcinoma its development, except in the rapidly infiltrating type, is much slower and does not assume the proportions of the syphilitic adenopathy of a chancre nearly so rapidly. In spite of experience we are certain that every clinician has at one time or another been mistaken in this differential diagnosis.

It is in this type of lesion that procedures of precision, laboratory investigations, are of the greatest value, but it must be pointed out that even negative observations, both in the direct and indirect methods of demonstration of the presence of treponemes, must not be accepted as final. In certain instances it will be necessary to remove a small section of the border of the lesion by the use of electrocautery in one form or another, permitting the disposition of the diagnosis to rest on the pathologic picture thus revealed.

6. *Tuberculosis*—The bacillus of tuberculosis may become inoculated on the lip or on the gums or on the tongue or on the tonsils, either from a self-implanted lesion from pulmonary tuberculosis of the patient, or by an accidental inoculation from without. It will usually produce a single lesion which will bear the characteristics of a chronic granulomatous process. The earliest sign is that of a small lump which progresses slowly, changing the aspect of the mucous membrane to a dark color and then, within a reasonable length of time, producing an induration as the result of the fibroblastic development in the corium of the mucosa. Later on, through the occlusion of blood vessels and through pressure produced by the chronic inflammatory exudate, necrosis will occur. This will usually be of multiple character; that is, several distinct, individual, and also confluent necrotic areas will result. Associated with this a lymphadenitis may be discernible. However, the process will be very much slower in development than a chancre.

An exception to this occurs when, through secondary invasion of a pyogenic organism, the necrotic process is increased in rapidity of development and extent. At times there occurs a type of tuberculosis of a vegetative character, the result of hypertrophy of the superficial structures of the mucous membrane. This usually



Fig. 28—Gumma of the upper lip.

lacks the ulcerating character and tends to be hemorrhagic on account of the fissuration which occurs in the lesion. The progression of this type of tuberculosis is even slower than the one previously described.

7. At times the differentiation between primary and tertiary or even secondary syphilitic lesions becomes

important. This will be described later.

SUMMARY OF THE CLINICAL CHARACTERISTICS OF A CHANCRE

The following are the clinical characteristics of chancre: (a) solitary (rarely multiple); (b) ulceration or tumefaction; (c) rapid progression; (d) associated regional adenopathy; (e) thick, adherent, dark encrustation when ulcerative; (f) induration; (g) lack of pain; (h) positive dark field for presence of *Treponemata pallida*, and (i) positive "local complement and precipitation test."

The importance of the early diagnosis of a chancre is apparent when one considers the great harm that may result if, through ignorance or carelessness, the *T. pallida* is inoculated directly or indirectly into another person. On account of the exposed nature of the sore when it occurs about the mouth, and because of the intimate contact of people, such a possibility is not a remote one. Especially the dentist, who is fre-



Fig. 29—Healed gumma of the upper lip.



Fig. 30—Carcinoma of the lower lip. Note slow progressive hardness and a pearly border.

quently called on to treat patients while such a lesion may be in existence is endangered. It is during this stage of the disease that the greatest amount of good for the patient can be produced by the judicious use of antisyphilitic remedies.

THE SECONDARY STAGE

After a period of three to four weeks or longer, following the appearance of the chancre, the entire

body of the patient responds with manifestations which bring into the foreground the fact that syphilis is a systemic disease. This reaction is present in all parts of the body, producing toxic and invasive changes in the various tissues and organs. For purposes of diagnosis, those occurring on the skin and the oral mucous membrane, in addition to the blood, are of the greatest value.

Briefly, the cutaneous surfaces show a rapid and generalized development of flat or raised, purulent, or nonpus-forming, discrete or coalescing, scaly or crust-covered reddish lesions. Most frequently these symptoms are ushered in with a slight rise in temperature, which Osler⁶ calls the "fever of invasion." Headache, general malaise, and irritability are added to the symptom complex.

For the consideration of this paper, the lesions found on the oral mucosa are the important ones. Generally, lesions of the secondary stage of syphilis are ushered in shortly after the previously described fever of in-

vasion with a slight sore throat or the so-called syphilitic angina. The severity of this angina varies. Usually, however, it is of the subacute variety and reminds one of a moderately inflamed pharynx. Patients who are subject to frequent pharyngitis may scarcely notice its presence, but they will note that its duration is protracted. Concomitant with this angina, there occurs the development of discrete, oval or rounded, grayish-white or reddish-pink patches involving the tongue, the buccal mucosa, and commissures of the mouth.

On the anterior third, and close to the margin of the dorsum of the tongue, a few elongated, oval patches will be discerned, surrounded by a slightly raised, reddish, inflammatory halo. Similar lesions occur on the remainder of the labial and buccal mucosa. They are spoken of as the erosive papules or the secondary mucous patches.

The lesions at the commissures may vary. Through moisture and contact of the superimposed surfaces, the



Fig. 31—Tertiary syphilis. A somewhat extensive lesion. Note its configuration.



Fig. 32—Nodular tertiary syphilis. Note the configuration and pigmentation.



Fig. 33—A, Nodulo-ulcerative syphilis before treatment.



Fig. 33—B, Nodulo-ulcerative syphilis after treatment.

⁶Osler, William: Principles and Practice of Medicine, New York, D. Appleton & Co., 1910, p. 267.

papules become flattened and elevated, resembling the flat papules of secondary syphilis, which are seen in other locations where two skin surfaces rub against each other, as about the anus or under the breasts; these lesions resemble hypertrophic papules about the arms and groin called condyloma. The tongue itself appears swollen; indentation of the teeth can be discerned around its margin.

Rarely are the secondary lesions of the oral mucosa of blister or vesicular character. However, they are recognized infrequently because the roof of the blister is of short duration, for through maceration and mechanical friction the blisters soon become denuded.

Secondary mucous patches of unusual appearance occur at times. An example of this can be seen on the roof of the mouth. Here the lesions as the result of being rubbed by the opposed dorsum of the tongue become elevated, enlarged, and plateau-

like. They belong in the category of condyloma-like lesions.

SUMMARY OF THE CLINICAL CHARACTERISTICS OF THE MUCOUS PATCHES

The mucous patches are clinically characterized by (a) multiplicity; (b) rapidity on onset; (c) oval shape; (d) covering membrane of glistening grayish-white character; (e) an indefinite inflammatory areola surrounding the lesion, and (f) an associated angina and frequently a subacute glossitis. (g) The lesions are not painful but may become sensitive from irritating food. (h) There is an associated generalized eruption on the skin, and (i) generalized lymphatic gland enlargement in the epitrochlears, cervicals, inguinals, etc. (j) The reactions to the complement fixation (Wassermann) test and the precipitation (Kahn) test are positive. These characteristics may be exaggerated and modified in the presence of a concurrent gingivitis or Vincent's angina.

Mucous patches are highly infective and may be the means of spreading syphilis in many instances, again through the same channels as were described under the primary stage.

On account of the frequent occurrence of gingivitis in conjunction with mucous patches, which calls so frequently for treatment by the dental surgeon, too much emphasis cannot be laid on the importance of the recognition of these lesions by the dentist for his own protection. *We want to reemphasize the fact that no matter where the chancre was located originally, secondary lesions of the oral mucosa occur in the vast majority of syphilitic patients.*

DIFFERENTIAL DIAGNOSIS

Mucous patches might be confused with (1) recurrent ulcerative stomatitis or aphthous stomatitis; (2) Vincent's infection; (3) toxic erythema; (4) perleche, or (5) leukoplakia.

1. *Recurrent Ulcerative Stomatitis or Aphthous Stomatitis*—In this entity, the lesions are few or many, oval or rounded, sharply defined by a marked inflammatory halo, with a central depression which is usually covered by a grayish or yellowish pyogenic membrane. The condition is evanescent; individual lesions last about a week, causing marked symptoms of burning and of actual pain, especially on motion. Occasionally they bleed, but that is not the rule. The history of their previous existence, their associated hypersensitivity, and the clinical characteristics described are of value in establishing the diagnosis in differentiation from syphilitic mucous patches.

2. *Vincent's Angina or Trench Mouth*—This clinical entity is characterized by an ulcerative gingivitis, producing elongated or rounded, minutely ulcerative lesions, usually grayish in appearance on an edematous and hyperemic base. The lesions are painful, bleed readily, and cause restriction in the mobility of the mouth. Associated with the lesions is a marked fetor oris which is distinctive and which has been likened to the odor of decaying matter. A smear taken from the ulcerations shows the presence of a preponderance of fusiform bacilli and the spirilli of Vincent. Extreme caution is necessary, however, because (as has been noted) the two diseases, Vincent's angina or



Fig. 34—Nodulo-ulcerative tertiary syphilis. This is an extensive lesion affecting the entire upper lip. Resembles a tuberculosis ulceration.



Fig. 35—A nodular tertiary syphilide. The lesion was dark red, raised unevenly and progressed slowly. There was no glandular enlargement present. Note its resemblance to the next two illustrations.

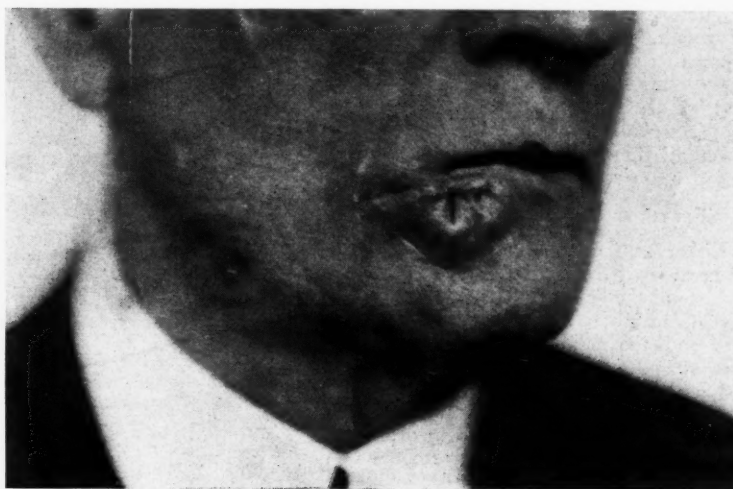


Fig. 36—Carcinoma of the lower lip. Here is another clinical variety which resembles the preceding illustration. The kidney shape, the nodulation without ulceration and its steady and slow progression are the important clinical features. Note the glandular enlargement.

Vincent's infection and syphilis, may occur together.

3. *Toxic Erythema*—This is a bizarre and multiforme eruption which produces bullae, vesicles, hyperemic patches, areas of more or less necrosis, and is usually associated with eruptions on the extremities. Drugs as antipyrin, luminol, etc., canned foods, fish, etc. may be the causative agents. Their sudden onset, their multiforme character, the history pointing toward the offending ingested substance, the lack of lymph node involvement are of considerable importance in the differentiation from syphilitic mucous patches.

4. *Perleche*—Because secondary lesions are so frequently seen at the commissures of the mouth, differential diagnosis between mucous patches in this location and perleche is necessary. This clinical entity, which is produced by streptococci, staphylococci, or fungi, occurs as a slight cracking and fissuration at the angle of the mouth. It appears as a fissure, elongated, macerated, and whitish-gray. It is painful and creates the sensation of dryness which necessitates frequent moistening with the tongue; this in turn increases the maceration and fissuration until a well marked condition is created. Usually there are no lesions within the mouth. This serves as an important diagnostic feature in differentiating perleche from syphilitic mucous patches.

5. *Leukoplakia or Smokers' Patches*⁷—This is a chronic disorder of the oral mucosa, characterized by oval, elongated or irregularly shaped, thickened whitish patches which may go on to the formation of fissures, and later may undergo cancerous degeneration. As leukoplakia are usually rough, thickened, and protrude from the underlying structures; as the evolution of the lesions is slow, and as these are not concomitant signs associated with the disorder, the differentiation will cause only occasional confusion.

TERTIARY MANIFESTATIONS

Either as the result of treatment or because of the increase in the resistance of the body and the resultant development of antibodies in the tissues and the fluids, the manifestations of the secondary stage disappear, and with the exception of a few inconspicuous scars or pigmentation, they leave no appreciable remnant. The duration of the secondary stage lasts from six weeks to ten weeks, or even for a longer period, after which the tertiary period is ushered in.

⁷Hollander, Lester; Pemias, H. H., and Schonfeld, Leo: Leukoplakia of the Oral Mucosa, J. A. D. A., to be published.



Fig. 37—Syphilis of the ulcerative type. Appearance suggests carcinoma of the lip.



Fig. 38—Appearance after two months of antisyphilitic treatment.



Fig. 39—Interstitial sclerosing glossitis (tertiary syphilis). Note uneven surface, localized atrophy of mucosa; the process is shown in evolution.

The tertiary period may be either latent or active. Latency means that there are no visible or demonstrable signs of the disease; activity means the exact opposite. It is the active tertiary stage which concerns us.

All the tertiary lesions are the manifestations of a more or less deep-seated granulomatous process in the corium of the mucosa. Clinically several varieties are recognized, but these depend on the single or multiple character, on the size and evolution of the same process.

When the lesion is large and extensive, when it is limited to a single or to a few lesions, it is spoken of as a gumma. This type appears as a slowly growing, rounded, painless tumefaction, having the character of resiliency of rubber. It is this quality which gives the process its name, *gummi*, meaning rubber in German. The mucous membrane which covers this lesion is darker and appears smooth, shiny, and somewhat tense.

Either through central necrosis, which follows the obliterating endarteritis or as the result of trauma, the lesion, if untreated, may undergo ulceration, forming a fairly typical picture.

About the center of an indurated mass there occurs a necrotic area, the margins of which are sharply defined, overhanging and deeply excavated; the floor is dirty, with an uneven base, and appears indolent in character. If it is on the lip, where it becomes exposed to the air, a heavy, thick crust will form and form again on removal.

Solitary gumma occurs most frequently on the tongue or on the palate, but may occur anywhere on the oral mucosa.

When the granulomatous process is composed of a larger number of small lesions in various stages of evolution, the clinical picture will be that of a nodular, circinate group in which some of the nodules have undergone ulceration. This type is referred to as the nodulo-ulcerative tertiary syphilitic lesion.

A typical nodulo-ulcerative lesion is unilateral, slow in development, circinate or serpiginous or kidney-shaped in configuration, which is the result of the coalescence of small gummas at various sectors of the circle of the induration. The ulceration differs from that of a solitary gumma in extent and depth. The entire lesion progresses peripherally, usually healing in its central area. The amount of destruction produced depends on how long any of these lesions exist without proper treatment, and also on the firmness of the structure on which they are located; for example, marked destruction occurs on the uvula and free border of the soft palate in a relatively short time.

Tertiary syphilitic lesions of the tongue are numerous and their consequences are serious. It is a frequent location of the single or multiple

gumma formation. Nodulo-ulcerative lesions may also occur, but in addition to these two, there is another clinical picture that may occur.

This is classified under the term of interstitial or the sclerosing type of glossitis. It begins with a more or less generalized chronic inflammatory process in the connective tissue structures of the tongue. It is associated with an obliterating endarteritis, as the result of which the mucosa of the tongue becomes slowly but definitely obliterated. It appears in the form of a moderate or extensive atrophy, resulting in a less motile, less sensitive, and less elastic organ.

All the tertiary lesions of syphilis, on account of their destructive tendency, are scar-producing. The depth and size of the scar is in direct ratio to the amount of necrosis produced. Therein tertiary lesions differ greatly from the secondary lesions of syphilis but simulate the primary one, the chancre and other chronic specific or nonspecific granulomatous processes. It is from the latter, and from carcinoma that they must be differentiated.

Among disturbances of the oral mucosa that cannot be classified as independent lesions produced by syphilis are the lesions of leukoplakia, but even a superficial review of the literature will show that syphilis acts as a predisposing systemic cause and its presence always requires a careful study of the patient. We have seen a few cases of leukoplakia that responded to antisyphilitic treatment.

DIFFERENTIAL DIAGNOSIS

1. *Carcinoma*—The resemblance and the coexistence of these two disorders (which will be discussed later)

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requires the closest scrutiny and diagnostic acumen, and in some instances this differentiation may give rise to a great deal of doubt, even to the most experienced syphilographer. The location of carcinoma of the oral cavity may be anywhere, but the lower lip, the tongue, the floor of the mouth, and the anterior pharyngeal wall are the most frequent areas of occurrence.

Carcinoma is a new growth, invasive and destructive in character, giving rise to the formation of tumors which are not limited by a surrounding wall or capsule, and sooner or later, by undergoing necrosis, cause ulcerations. Further development results in the invasion of the lymph nodes, which manifests itself in the formation of gradually enlarging swellings in the submental, submaxillary, or the cervical areas.

For clinical purposes two main types of carcinoma⁸ are recognized: (a) the superficial papillary type, and (b) the deeply infiltrating type. In the former, the tumor may attain considerable size and protrude prominently from the site of its occurrence, break down slowly, and only after a considerable time has elapsed, the retarded secondary lymph node involvement may occur. In the latter type, tumefaction may be slight, the area breaks down early, and the lymph node involvement may be entirely out of proportion to the size of the original carcinoma.

The principal clinical characteristic of carcinoma is a hardness of the lesion which has been aptly referred to as "plaster of Paris" quality. This hardness differs from the induration

⁸Hollander, Lester: Carcinoma of the Oral Cavity. Arch. Dermat. & Syph. 21: 519-523, (April) 1930.

of tertiary lesions but at times gives rise to considerable confusion. Ulceration of a carcinoma differs at its base from the ulceration of a tertiary syphilis; neoplastic nodules, less encrustation, and no tendency to spontaneous healing will be observed here. The edges will be found to be much firmer, more rolled, and usually less pigmented than in syphilis. The most valuable and critical procedure in a lesion that offers any doubt is to take recourse to a biopsy from the lesion and to have it examined by a competent pathologist. Occasionally, even this may be misleading.

2. *Chancre*—The resemblance of a solitary gumma and chancre may offer difficulty. This differentiation is not merely of academic value, as the infective nature of the two lesions varies greatly, a chancre being highly infective. One may place reliance principally on the rapidity of development of the lesion. A chancre will attain a much larger size in a much briefer period than a tertiary lesion. One may also rely on the presence or absence of regional adenopathy, the latter occurring with a chancre.

The dark field examination will be found positive in a chancre, negative in a tertiary lesion; while the Wassermann and Kahn reactions will usually be negative in chancre.

3. *Other Granulomas*—Tuberculosis and the deep-seated mycelian infections, as actinomycosis and coccidioid granuloma, are at times to be considered as a diagnostic possibility. In tuberculosis positive diagnosis frequently necessitates a biopsy study, while the latter depends on the discovery of the pathogenic fungi either in a direct smear or by culture.

(End of Second Installment)

ABOUT OUR CONTRIBUTORS

The biography of Harry N. Workhoven, D.D.S., appeared in the December, 1932, issue of THE DENTAL DIGEST.

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The biographies of Lester Hollander, M.D., and B. A. Goldmann, M.D., appeared in the March, 1934, issue of THE DENTAL DIGEST.

The biography of Seth W. Shields, D.D.S., appeared in the October, 1932, issue of THE DENTAL DIGEST.

The Editor's Page

IN a short and significant statement published in the current issue of this magazine (page 124) Doctor Herbert E. Phillips, the most outstanding economist in the dental profession, suggests that the future discussions of health insurance will be with trade union groups rather than with industrialists. That is, the professions will deal with the representatives of labor instead of with the representatives of capital. If and when either voluntary or compulsory health insurance is accepted on a large scale in the United States the trade unionists, according to Doctor Phillips, will suggest the terms, the fee schedules, and the conditions of cooperation with the medical and dental professions. The strengthening labor groups and the guarantee of collective bargaining under the terms of the National Recovery Act are facts to support the contention of Doctor Phillips. And the most significant single event to substantiate this argument is seen in the recent controversy between the traditional open-shop automobile industry and the labor groups.

Provided some far-reaching form of health insurance becomes a reality in the United States (and all present evidence suggests that it will) would the interests of the professions be served better by cooperating with labor or with capitalistic groups? Furthermore, would there be any important difference if the professions were to deal with company unions or with craft unions affiliated with a national labor federation? Likewise, what important difference would there be in the case where the producers of medical services dealt with consumer-representatives (labor) in contrast with payer-representatives (capital)? Would the demands be greater and the professional standards be higher from the persons who received the service or from the persons who merely partly paid for the service?

These questions open a wide field of discussion; a field in which one finds it extremely difficult to detach himself from his traditional patterns of thought. On the subject of capital versus labor we are all likely to have deep-seated convictions and preconceptions. Generally speaking, professional men, although seldom capitalists in their own right, prosper most in a functioning capitalistic econ-

omy. In an economic system of salaries, dividends, interests, rent, the average professional man is likely to attract more persons who can pay profitable fees: witness the late Lusty '20's. Conversely, when the capitalistic system hesitates the professional man feels the shock at an early day. He is likely, then, to associate his fate with the fate of capitalism, and thus throw his sympathies toward capital and against labor and state authoritarianism.

Because he thinks in this way, the dentist in considering the subject of health insurance, if and when it comes, is apt to feel that he would rather deal with employers groups than with labor groups. The suggestion, therefore, that his professional values might better be protected by dealing with labor would probably come as a shock.

In any system of third-party practice—under State or insurance funds—the profession is agreed that the values of personal relationship and free choice of dentist by the patient must be preserved. The employer group under a system of health insurance could be expected to be more concerned about standardization and low cost of service. For the one who pays the larger share of the bill and is not the consumer we would expect the philosophy of the most for the money—quantity. The patient-consumer who is represented by the labor group may be expected to be seriously interested in quality of service, of all possible additional medical benefits, and of the preservation of personal relationship and free choice. When the person who receives any kind of medical care is in the position to suggest the kind and type he is certain to prefer *quality*; when the person pays for the care and does not himself receive it or have any direct interest in the one who receives it he would undoubtedly demand *quantity*.

If Doctor Phillips is correct in his point of view that the professions should begin to think in terms of cooperation with labor organizations in formulating health insurance plans we should insist that the dental profession be represented ably and early in the deliberations. The spokesmen for the dental profession must be no feeble men, for their dealings would be with labor leaders experienced in the art of bargaining and familiar with direct action.

GANGRENOUS STOMATITIS

REPORT OF A CASE

SETH W. SHIELDS, D.D.S.

Indianapolis

MOST authors¹ seem to agree that gangrenous stomatitis (cancrum oris, noma, gangrene of the mouth, malignant edema) is always found in debilitated cachectic patients. Frequently, following some exanthematous disease, the initial lesion often appears at the bucco-muco fold, although it may start at the gingivae. From a small ulcer, gangrenous decomposition rapidly involves the surrounding soft tissues, strips the periosteum from the bone, through and including the skin and often death terminates the case. More cases are reported following measles than any other disease. Burchard and Inglis assert that, "The extent of tissue destruction bears a constant relation to the underlying debility of the patient."

During the course of the disease, the cheek becomes indurated, swollen, and painful. Large portions of gangrenous, fetid flesh becomes dissected free. The temperature gradually increases as the lesion progresses.

Organisms found consist of the spirochetes, fusiform bacillus, diplococcus, diphtheroids (pseudodiphtheria bacillus). In the case reported here the vibron septique or bacillus of malignant edema was found.

TREATMENT

The general treatment consists of supportive measures, such as high caloric liquids, opiates for pain, and blood transfusions. Locally, spirocheticides are administered, and gentle dissection of the decomposed sloughs is done. Some advocate surgery and electrocauterization.

Fortunately, noma is a rare condition. I feel safe in saying that a more pathetic condition is not to be found. These patients usually are conscious and rational until the extreme late stages.

REPORT OF CASE

History—Thomas K., a white boy, aged 12 years, was admitted to the Riley Hospital, October 12, 1932. His chief complaint was marked swelling of the right jaw, associated with pain and fever, the onset of

which was one week previous to admission. Swelling first appeared in the glands of the neck. In the course of forty-eight hours the swelling spread into the jaw, then gradually decreased to a perceptible degree, then again became worse until the right eye closed. The patient had been kept in bed the entire week because of chills and fever. He also began expectorating foul-smelling pus and necrotic tissue.

According to his mother, the boy was apparently well until September 1, 1932, when a right mandibular first molar was removed under block anesthesia. It had been acutely infected but the attending dentist had treated this infection until the acute symptoms disappeared. He had had German measles six years previous to admission. The boy had been struck by an automobile and had received a blow from an older boy three weeks preceding admission, but no major injuries or bruises were noted. The gums at the site of the extraction had been uncomfortable.

The family history was essentially negative.

Physical Examination—On admission the patient appeared well nourished. There were no unusual observations noted on general examination other than a markedly swollen and indurated right jaw and face with the right eye closed. The anterior cervical lymph glands were enlarged.

The chest was normal on percussion; no rales were heard. The heart action was regular; no murmur was heard, but the heart beat rapidly.

Examination of the abdomen, extremities, and skin was negative.

Examination of the mouth revealed a small sloughing ulcer in the bucco-muco fold opposite the right maxillary bicusps. We were told that poultices had been applied to this area continually to establish drainage. The socket of the right lower first molar appeared normal.

The temperature was 102°F.; the pulse, 124. The urine showed a slight trace of albumin but was otherwise negative. The red blood count was 2,500,000; the white count 76,000. Although this white count was unusually high we know that in severe

infections in children the increase is sometimes spectacular.

The admitting physician was of the impression that the patient had (1) osteomyelitis of the right maxilla; (2) cellulitis of the right cheek.

COURSE: DIAGNOSIS: THERAPY

I saw the patient immediately after admission to the ward along with a pediatrician and a surgeon. Roentgenograms were ordered, cold packs externally applied, and the usual orders for any general infection written.

The roentgenograms revealed a marked opacity over the region of the right antrum. The right walls appeared thinner than the left, but we believe the appearance was caused by the colossal swelling of the soft tissues. The haziness extended well over the orbit. No bony involvement could be demonstrated.

In the course of a few days the patient's condition remained unchanged, and then gradually he became weaker and there was a slight increase in the intra-oral slough. A diagnosis of gangrenous stomatitis was made, and the patient placed in strict isolation. Smears of the lesion disclosed diphtheroids, a few spirilla and the fusiform bacillus. Also the vibron septique or the bacillus of malignant edema was present.

Locally, sodium perborate paste was liberally applied and a mouthwash was prescribed of 50 per cent hydrogen dioxide to be used every four hours night and day.

The patient was given 20,000 units of anti-gas bacillus gangrene serum intravenously and a like amount intramuscularly. His improvement after this was rapid and we believed he would recover with continued use of the serum. On the strength of this, daily transfusions of citrated blood were given from 250 cc. to 400 cc. along with 1,000 cc. of saline. The serum was given in daily doses of 20,000 units intravenously. A total of fourteen transfusions were given and 240,000 units of anti-gas gangrene serum injected.

Improvement became gradual but on the eighth day after isolation the patient became worse. The next day Penrose drains were inserted into the cheek, but the area did not drain. Gas freely bubbled through the foul-

¹Mead: Diseases of the Mouth. Endlemen and Wagner: General and Dental Pathology. Burchard and Inglis: Dental Pathology and Therapeutics. Blair and Ivy: Principles of Oral Surgery. Emerson: Clinical Diagnosis, Physical Diagnosis.



Fig. 1A



Fig. 1B

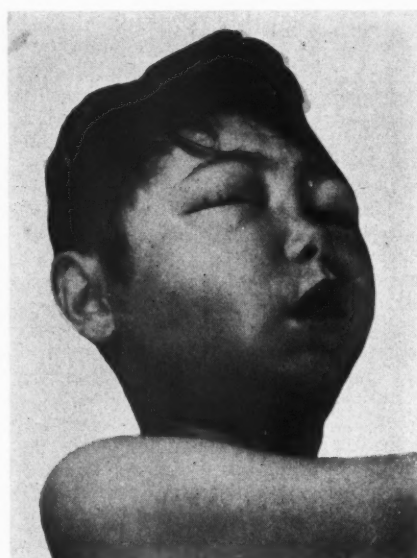


Fig. 1C

Fig. 1—A, B, and C, Appearance of patient one week after admission, October 19, 1932.

Fig. 2—A and B, Two views of patient on October 21, shows slight improvement.



Fig. 2A



Fig. 2B



Fig. 3A
Fig. 3—A and B, Appearance of patient growing progressively worse, October 24.



Fig. 4A

Fig. 4—A and B, Later appearance.

Fig. 4B



Fig. 5A

Fig. 5—A and B, Appearance on November 3, 1932.

Fig. 5B

smelling serum and the necrotic flesh of the cheek. The patient died on the twenty-third day, probably from extreme toxemia.

COMMENTS ON THE BLOOD ANALYSIS

The study of the blood of this case

was particularly interesting. There was an enormous leukocytosis which demands for its explanation a general systemic infection. At least, no local signs were found in the lungs or elsewhere in the body.

In making drafts of these differen-

tial counts we have considered as one group all mononuclear nongranular cells of the types which belong to normal circulation; as one group also, all finely granular polymorphonuclear leukocytes; and as one group, the myelocytes, metamyelocytes and pre-

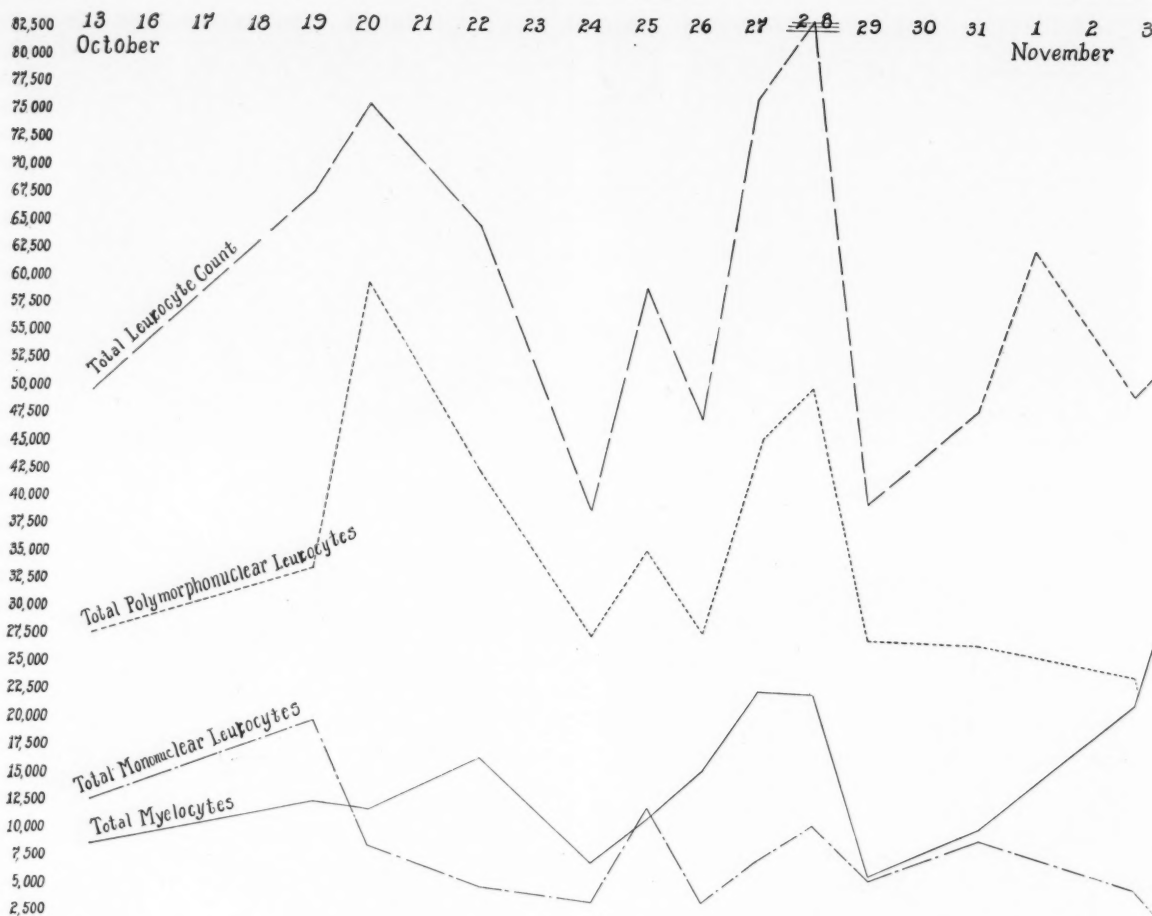


Fig. 6—Graph of the white blood counts. Only total counts charted, not percentages.

Date	10-13-32	10-19-32	10-20-32	10-22-32	10-24-32	10-25-32	10-26-32
R. B. C.	2,900,000	2,000,000	2,000,000	2,000,000	2,370,000	3,000,000	2,330,000
Hbg.		5	3	6.5	7.5	8	7
W. B. C.	50,000	68,000	81,000	65,000	39,200	59,400	47,600
Polymorph.	51	48	67	63	68	58	59
Lymphocytes	22	30	8	7	10	21	8
L. Monocytes	4	1		1			
Myelocytes	14	13	10	20	14	14	27
Myeloblasts			2				
Premyelocytes		5					
Atypical Lymphocytes			3				
Metamyelocytes	4	1	3	6	5	5	6
Band (stab)	5	2	7	3	3	2	
Blood Wassermann	10-15-32	Negative.	Kahn Negative.	Kline Negative.			

Date	10-27-32	10-28-32	10-29-32	10-31-32	11-1-32	11-3-32	11-3-32
Hbg.	8.5	9.5	10.5	9	11.5	10.5	9.5
R. B. C.	2,500,000	3,180,000	3,200,000	3,390,000	3,700,000	3,380,000	3,020,000
W. B. C.	76,500	84,100	40,000	48,500	63,000	50,000	52,000
Polymorph.	59	57	68	53		47	30
Lymphocytes	10	8	14	22		11	6
L. Monocytes		3	1				
Myelocytes	28	27	16	22		40	61
Atypical Lymphocytes		2					
Metamyelocytes	2						2
Band (stab)	1	3	1	3		2	1

(Text continued on page 149)

(Continued from page 146)

myelocytes. The total counts of each of the groups under consideration are charted, not their percentages.

The total number of the mononuclear nongranular cells ran much more parallel to the total leukocyte count than did that of the polymorphonuclear cells; also, its rise sometimes preceded that of the total count by one day. Incidentally, never in the fourteen counts made was one coarsely granular cell (eosinophile) found.

While the total count of polymorphonuclear granular cells at first ran

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"A woman, aged 35, who just left my office told me a strange story. She has a sore on her lip which she said originated from a burn from modeling compound received six years ago when she had her denture made. The patient says that the sore never completely heals. Sometimes it almost disappears and then it 'breaks out' again. Sometimes sores appear in several places, on the lips and on the inside of the mouth. She has been told by various physicians she has consulted that this burn, according to her story, is a 'permanent burn.'

"I thought of syphilis, as a causative factor but there are no supporting symptoms. The patient appears healthy although she told me that it took her a very long time to recover from a tonsil operation which she had undergone several years ago."—L. F. H., D.D.S., Wisconsin.

ANSWER—The editor of THE DENTAL DIGEST has asked me to answer your letter regarding your patient with the sore on her lip.

Three types of chronic lesions in the mouth that are most common are syphilitic, tuberculous, and malignant. Chronic syphilitic lesions are gummas which are ruled out by the Wassermann test and, if necessary, a biopsy. Tuberculous lesions of the mouth are usually secondary to advanced tuberculosis of the lungs. A general physical examination with roentgenograms of the chest and a biopsy examination will establish or rule out this type of lesion. A malignant lesion is usually an epithelioma; here again, a biopsy examination establishes the diagnosis.

The factor that speaks against a malignancy is the statement that the sore almost heals and then reappears and that the patient gets sores in several areas. In all my observations I have never seen an epithelioma heal either partly or completely. Of course, there is the possibility that the one permanent lesion is due to one cause and the other sores are due to another.

No great harm could come to the patient if, under aseptic conditions with a very sharp knife, a section was removed from the most suggestive part of the permanent lesion and placed in 10 per cent formalin solution and sent to a reliable laboratory for diagnosis of pathologic conditions.

There is also the possibility that the

quite parallel to the total leukocyte count, on October 27 the change began. The curve of the mononuclear nongranular cells remained parallel to the total count, but the myelocyte count began to rise, while that of the polymorphonuclear finely granular cells first remained constant and then fell. This is the so-called "shift to the left" of the blood formula, owing to the appearance in the blood stream of immature forms of leukocytes. It occurred, however, chiefly during the last days of life, and therefore had no immediate prognostic value.

LETTERS TO THE EDITOR

lesion is of some rare type that does not fall under the usual category listed here.

This is the best advice that I can give without making a clinical examination of the patient.—JOSEPH E. SCHAEFER, M.D., D.D.S., Chicago, Illinois.

"In all the years that I have been with Doctor Beller, I cannot recall any time that he ever spent two dollars more wisely or of any better benefit to himself financially and educationally than for THE DENTAL DIGEST."—MISS SALLY CAIRNE, Assistant to DR. HARRY BELLER, New York, New York.

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CONCLUSIONS

1. Unfortunately we have no record of the blood previous to extraction of the tooth, and therefore cannot discuss the patient's probable debility.

2. The condition developed following two recent injuries which may have lowered the resistance of the tissues of the mouth to infection by germs almost normal there.

3. The tooth extraction may possibly have been an unfortunate procedure but seemed thoroughly indicated.

gotten up."—FOREST K. PAUL, D.D.S., Indianapolis, Indiana.

"I think the Patient Charts are an excellent medium in explaining to patients their dental difficulties. They save time and are so clear that a patient of ordinary intelligence can form an idea of what his dentist is trying to explain."—J. PROKUPEK, D.D.S., Antigo, Wisconsin.

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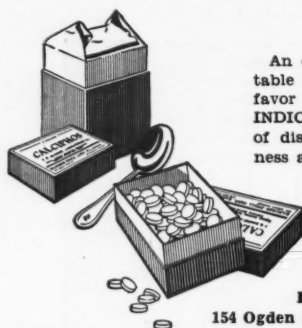
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